

**PATENT**

Attorney Docket No. 7374/72586

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application of:

STANGEL et al.

Application No.: (Divisional of 09/391,377)

Filed: Herewith

For: A CURING METHOD AND MATERIAL COMPOSITIONS  
HAVING DENTAL AND OTHER APPLICATIONS

February 14, 2002

9/A  
0.7  
11/5/02**FIRST PRELIMINARY AMENDMENT**Commissioner for Patents  
Washington, D.C. 20231

Dear Sir:

Please enter this first Preliminary Amendment:

IN THE SPECIFICATION:

Page 1, after the title, insert

Cross-Referenced Applications

AN This application is a divisional application of U.S. Application 09/391,377, filed September 8, 1999, and this application claims the priority benefit of provisional application 60/099,654, filed September 9, 1998.

Divisional of 09/391,3  
STANGEL et al.

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# REMARKS

The First Preliminary Amendment incorporates the application lineage per 35 U.S.C. § 120.

The Examiner is specifically directed to the Search Report for PCT/US99/20960, which appears to related to U.S. Patent No. 6, 254,389. A copy of the latter patent is also enclosed.

Respectfully submitted,

FITCH, EVEN, TABIN & FLANNERY

By:



Kendrew H. Colton  
Registration No. 30,368  
Telephone No. (202) 419-7000  
Facsimile No. (202) 419-7007

FITCH, EVEN, TABIN & FLANNERY  
1801 K Street, NW  
Suite 401L  
Washington, DC 20006-1201  
Telephone: (202) 419-7000  
Facsimile: (202) 419 -7007



PATENT

Attorney Docket No. 7374/72586

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Re Application of:

STANGEL et al.

Application No.: 10/074,051

Filed: May 14, 2002

For: A CURING METHOD AND MATERIAL COMPOSITIONS  
HAVING DENTAL AND OTHER APPLICATIONS

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November 14, 2002

## PRELIMINARY AMENDMENT

Commissioner for Patents  
Washington, D.C. 20231

Dear Sir:

Please enter this Preliminary Amendment:

IN THE CLAIMS:

Please cancel all claims without prejudice and add new claims as follows:

3941. (New) A microwave curable composition suitable for a denture base comprising
- (a) at least one member selected from the group consisting of a mono-, di- and/or tri-functional acrylic polymer and a mono-, di-, and/or tri-functional acrylic monomer; a curing agent; a filler; an initiator; a plasticizer; and optionally additional additives;
  - (b) at least one member selected from the group consisting of an organopolysiloxane and a phosphonitrile fluoroelastomer; a filler; a crosslinking agent; and, optionally additional additives, and
- or

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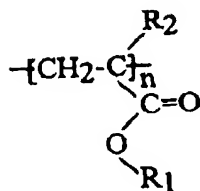
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U.S. Appl. No. 10/074,051 - STANGEL et al.

C1  
cont.  
R126  
(c) a polymer matrix including a polymerizable resin adapted for use in an oral environment which contains at least one of 2,2-bis[4-(2-hydroxy-3-methacryloxypropoxy)phenyl]propane, ethyleneglycol dimethacrylate; triethyleneglycol dimethacrylate, and/or an urethane dimethacrylate resin; a filler, initiator, a coupling agent and, optionally, additional additives.

40  
41. (New) A microwave curable composition suitable for a denture base according to claim 39, wherein said composition comprises (a).

41  
42. (New) A microwave curable composition suitable for a denture base according to claim 40, wherein said composition contains at least one acrylic polymer containing repeating monomer units represented by the formula



I

wherein

R<sub>1</sub> represents a hydrogen atom, an alkyl group, a substituted alkyl group, a benzyl group, a hydroxy alkyl group, a cyclic hydrocarbon, an ether group,

R<sub>2</sub> represents a hydrogen atom, a halogen atom, an alkyl group, or a substituted alkyl group, and

n is an integer of two or more.

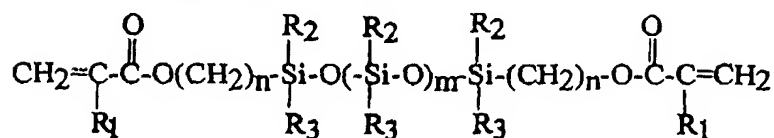
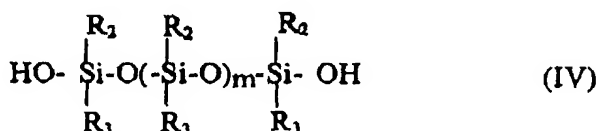
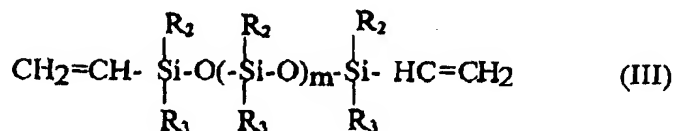
42  
43. (New) A microwave curable composition suitable for a denture base according to claim 41, wherein R<sub>1</sub> represents a hydrogen atom, an alkyl group, a cyclic hydrocarbon, a benzyl group, a hydroxy alkyl group, or an ether group.

43  
44. (New) A microwave curable composition suitable for a denture base according to claim 41, wherein R<sub>2</sub> represents a hydrogen atom, a halogen atom, or an alkyl group.

44  
45. (New) A microwave curable composition suitable for a denture base according to claim 40, wherein said filler comprises an organic filler or an inorganic filler.

*Prep*  
*Cl*  
*cont.* <sup>45</sup><sub>41</sub> (New) A microwave curable composition suitable for a denture base according to claim <sup>39</sup><sub>41</sub>, wherein, wherein said composition comprises (b).

<sup>46</sup><sub>47</sub> (New) A microwave curable composition suitable for a denture base according to claim <sup>39</sup><sub>47</sub>, wherein said organopolysiloxane is represented by any of formulas (III), (IV) or (V)



wherein said formulas

m represents a value of 1 to about 6,000,

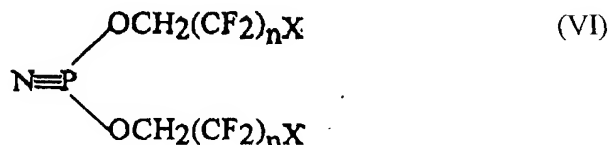
n represents an integer having a value of 1 to 6,

R<sub>1</sub> represents a hydrogen atom or an alkyl group,

R<sub>2</sub> represents an alkyl group of 1-6 carbon atoms, and

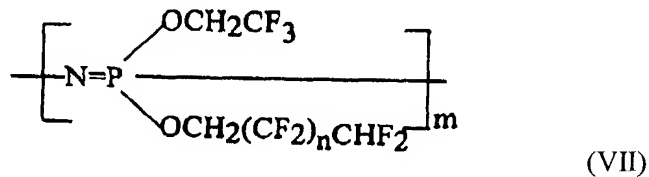
R<sub>3</sub> represents an alkyl group having 1-6 carbon atoms.

*R1/R2* <sup>47</sup><sub>47</sub> (New) A microwave curable composition suitable for a denture base according to claim <sup>39</sup><sub>47</sub>, wherein said composition comprises (b) and said at least one phosphonitrile fluoropolymer that is represented by formula (VI):



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in which X represents a hydrogen atom or fluorine atom, n is a value of 1 to 11; or  
that has repeating monomer units represented by formula (VII):



in which n represents 3, 5, 7, 9 or 11 and m is from 10,000 to 50,000.

<sup>48</sup><sub>39</sub> 50. (New) A microwave curable composition suitable for a denture base according to claim 39, wherein said composition comprises (c).

<sup>49</sup><sub>48</sub> 51. (New) A microwave curable composition suitable for a denture base according to claim 48, wherein said initiator comprises at least one microwave sensitive compound.

<sup>50</sup><sub>49</sub> 52. (New) A microwave curable composition suitable for a denture base according to claim 49, wherein said initiator comprises at least one member selected from the group consisting of benzoyl peroxide, dilauroyl peroxide, (tert-butyl) peroctoate, tert-butyl perbenzoate, 2,4-dichlorobenzoyl peroxide and 4,4-dichlorobenzoyl peroxide.

<sup>51</sup><sub>49</sub> 53. (New) A microwave curable composition suitable for a denture base according to claim 49, wherein said composition contains 0.05% to 1.0% by weight of said initiator.

<sup>52</sup><sub>48</sub> 54. (New) A microwave curable composition suitable for a denture base according to claim 48, wherein said coupler comprises gamma-methoxypropylene silane or a thiomethacrylate.

<sup>53</sup><sub>40</sub> 55. (New) A microwave curable composition suitable for a denture base according to claim 40, wherein (a) further comprises an amine accelerator.

<sup>54</sup><sub>39</sub> 56. (New) A microwave curable composition suitable for a denture base according to claim 39, wherein said filler comprises particles having a particle size in the range of 0.04 to approximately 10 micrometers.

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<sup>55</sup><sub>57</sub>. (New) A method for forming a hardened object comprising

- (i) forming a hardenable dental composite from a microwave curable composition, or applying a microwave curable resin matrix to a tooth; and
- (ii) obtaining said hardened object by applying microwave energy to harden said composite or cure said resin matrix.

<sup>56</sup><sub>58</sub>. (New) A method according to claim <sup>55</sup><sub>57</sub>, wherein said composite is a dental prosthetic or orthopedic element.

<sup>57</sup><sub>59</sub>. (New) A method according to claim <sup>55</sup><sub>57</sub>, wherein said composite is a dental prosthetic and in (ii) the hardening is intra-oral using a hand-held microwave applicator.

<sup>58</sup><sub>60</sub>. (New) A method according to claim <sup>55</sup><sub>57</sub>, wherein said dental prosthetic is a composite filling, a crown, a bridge, an inlay, an overlay, a facing, a veneer or orthodontic appliance.

<sup>59</sup><sub>61</sub>. (New) A method according to claim <sup>55</sup><sub>57</sub>, wherein said microwave curable composite are according to claim 20.

<sup>60</sup><sub>62</sub>. (New) A method according to claim <sup>55</sup><sub>57</sub>, wherein in said method a hand-held microwave applicator is used in curing said resin matrix.

See Appendix

Divisional of 09/391,37  
STANGEL et al.

REMARKS

Please enter these claims. They considered supported by the specification for reasons of record in this or the parent application. Claims 41-56 correspond to claims 19-35 in the Second Preliminary Amendment.

Claims 57-62 relate to former claims 36-40.

Respectfully submitted,

FITCH, EVEN, TABIN & FLANNERY

By: 

Kendrew H. Colton  
Registration No. 30,368

FITCH, EVEN, TABIN & FLANNERY  
1801 K Street, NW  
Suite 401L  
Washington, DC 20006-1201  
Telephone: (202) 419-7000 7016  
Facsimile: (202) 419 -7007



[illegible]

In the claims:

Claims 20-40 canceled without prejudice

New Claims 41 - 62 added.

In re Application of:  
Application No.  
Filed:  
For:

STANGEL et al.  
10/074,051  
February 14, 2002  
A CURING METHOD AND MATERIAL COMPOSITIONS HAVING  
DENTAL AND OTHER APPLICATIONS



COMMISSIONER FOR PATENTS  
Washington, D.C. 20231

November 14, 2002

Sir:

Transmitted herewith is a Preliminary Amendment in the subject application.

☐ small entity status of this application under 37 CFR 1.27.

DUE DATE: N/A

☐ Petition For Extension Of Time

☐ for a -month extension of time under 37 CFR 1.136, the fee of \$00.00 is enclosed.

☒ petition for an extension of time is **NOT** necessary. However, to the extent that such petition is deemed necessary, for a sufficient extension of time to render the present submission timely. Please charge Deposit Account No. 06-1135 for the appropriate petition fee.

☒ No additional claim fee is required.

☐ Other:

The claim fee has been calculated as shown below:

					SMALL ENTITY		OTHER THAN A SMALL ENTITY	
	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	EXTRA CLAIMS PRESENT	RATE	ADDIT. CLAIM FEE	RATE	ADDIT. CLAIM FEE
TOTAL	22	MINUS	21	1	x 9=	\$	x 18=	\$9.00
INDEPENDENT	3	MINUS	3	0	x 40=	\$	x 84=	\$0.00
<input type="checkbox"/>	FIRST PRESENTATION OF MULTIPLE CLAIM				+ 135=	\$	+ 280=	\$
					TOTAL	\$	TOTAL	\$9.00

☒ Please charge my Deposit Account No. 06-1135 in the amount of \$9.00, under Order No. 7374/72586. A duplicate copy of this sheet is attached.

☐ A check in the amount of \$0.00 is attached.

☒ The Commissioner is hereby authorized to charge any deficiencies in the following fees associated with this communication or credit any overpayment to Deposit Account No. 06-1135. A duplicate copy of this sheet is attached.

☒ Any filing fees under 37 CFR 1.16 for the presentation of extra claims.

☒ Any patent application processing fees under 37 CFR 1.17.

Respectfully submitted,

FITCH, EVEN, TABIN &amp; FLANNERY

By:

Kendrew H. Colton  
Registration No. 30,368

Fitch, Even, Tabin & Flannery  
1801 K Street, N.W.  
Suite 401L  
Washington, D.C. 20006-1201  
Telephone No. (202) 419-7000  
Facsimile No. (202) 419-7007

# PATENT

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STANGEL et al.

Filed: Herewith

February 14, 2002

Dear Sir:

IN THE CLAIMS:

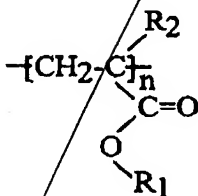
right

- microwave curable composition comprising a member selected from the group consisting of a di- and/or tri- functional monomer; a plasticizer; and an optional member selected from the group consisting of a thermoplastic elastomer, a filler; a crosslinking agent; a matrix including a polymer; and a hardener. The composition contains at least one of 2,2-bis[4-(4-phenyl)phenyl]propane, ethylene

dimethacrylate, and/or an urethane dimethacrylate resin; a filler, initiator, a coupling agent and, optionally, additional additives.

<sup>20</sup>21. (New) A microwave curable composition suitable for a denture base according to claim <sup>19</sup>20, wherein said composition comprises (a).

<sup>21</sup>22. (New) A microwave curable composition suitable for a denture base according to claim <sup>20</sup>21, wherein said composition contains at least one acrylic polymer containing repeating monomer units represented by the formula



I

wherein

R<sub>1</sub> represents a hydrogen atom, an alkyl group, a substituted alkyl group, a benzyl group, a hydroxy alkyl group, a cyclic hydrocarbon, an ether group,

R<sub>2</sub> represents a hydrogen atom, a halogen atom, an alkyl group, or a substituted alkyl group, and

n is an integer of two or more.

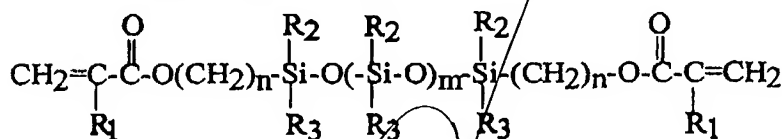
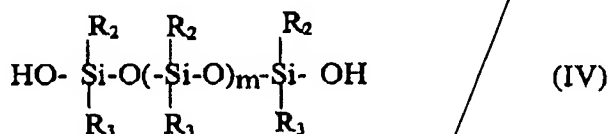
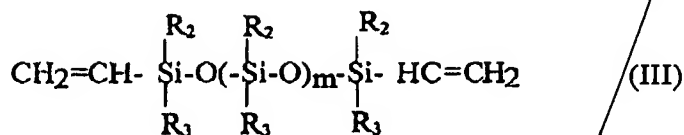
<sup>22</sup>23. (New) A microwave curable composition suitable for a denture base according to claim <sup>21</sup>22, wherein R<sub>1</sub> represents a hydrogen atom, an alkyl group, a cyclic hydrocarbon, a benzyl group, a hydroxy alkyl group, or an ether group.

<sup>23</sup>24. (New) A microwave curable composition suitable for a denture base according to claim <sup>22</sup>23, wherein R<sub>2</sub> represents a hydrogen atom, a halogen atom, or an alkyl group.

<sup>24</sup>25. (New) A microwave curable composition suitable for a denture base according to claim <sup>24</sup>24, wherein said filler comprises an organic filler or an inorganic filler.

<sup>25</sup>26. (New) A microwave curable composition suitable for a denture base according to claim <sup>25</sup>25, wherein said composition comprises (b).

24. (New) A microwave curable composition suitable for a denture base according to claim 25, wherein said organopolysiloxane is represented by any of formulas (III), (IV) or (V)



wherein said formulas

m represents a value of 1 to about 6,000,

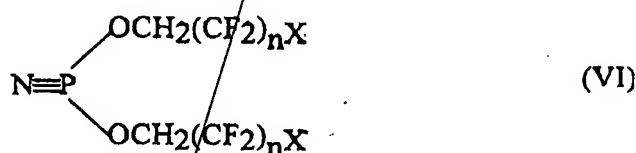
n represents an integer having a value of 1 to 6,

R<sub>1</sub> represents a hydrogen atom or an alkyl group,

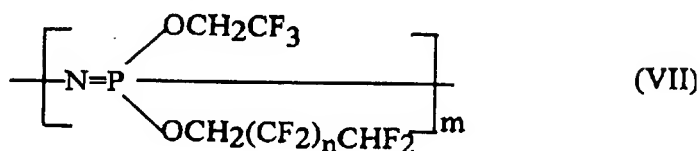
R<sub>2</sub> represents an alkyl group of 1-6 carbon atoms, and

R<sub>3</sub> represents an alkyl group having 1-6 carbon atoms.

28. (New) A microwave curable composition suitable for a denture base according to claim 20, wherein said composition comprises (b) and said at least one phosphonitrile fluoropolymer that is represented by formula (VI):



in which X represents a hydrogen atom or fluorine atom, n is a value of 1 to 11; or that has repeating monomer units represented by formula (VII):



in which n represents 3, 5, 7, 9 or 11 and m is from 10,000 to 50,000.

<sup>18</sup><sub>19</sub> 26. (New) A microwave curable composition suitable for a denture base according to claim <sup>18</sup><sub>19</sub> 20, wherein said composition comprises (c).

<sup>28</sup><sub>29</sub> 30. (New) A microwave curable composition suitable for a denture base according to claim <sup>28</sup><sub>29</sub> 29, wherein said initiator comprises at least one microwave sensitive compound.

<sup>29</sup><sub>30</sub> 31. (New) A microwave curable composition suitable for a denture base according to claim <sup>29</sup><sub>30</sub> 30, wherein said initiator comprises at least one member selected from the group consisting of benzoyl peroxide, dilauroyl peroxide, (tert-butyl) peroctoate, tert-butyl perbenzoate, 2,4-dichlorobenzoyl peroxide and 4,4-dichlorobenzoyl peroxide.

<sup>31</sup><sub>32</sub> 32. (New) A microwave curable composition suitable for a denture base according to claim <sup>31</sup><sub>32</sub> 31, wherein said composition contains 0.05% to 1.0% by weight of said initiator.

<sup>32</sup><sub>33</sub> 33. (New) A microwave curable composition suitable for a denture base according to claim <sup>32</sup><sub>33</sub> 32, wherein said coupler comprises gamma-methoxypropylene silane or a thiomethacrylate.

<sup>33</sup><sub>34</sub> 34. (New) A microwave curable composition suitable for a denture base according to claim <sup>33</sup><sub>34</sub> 33, wherein (a) further comprises an amine accelerator.

<sup>34</sup><sub>35</sub> 35. (New) A microwave curable composition suitable for a denture base according to claim <sup>34</sup><sub>35</sub> 34, wherein said filler comprises particles having a particle size in the range of 0.04 to approximately 10 micrometers.

<sup>35</sup><sub>36</sub> 36. (New) A method for forming a hardened object comprising  
(i) forming a hardenable composite from a microwave curable composition according to claim <sup>19</sup><sub>20</sub> 20; and  
(ii) obtaining said hardened object by using a hand-held microwave applicator to apply microwave energy to harden said composite.

~~34~~<sup>36</sup> 38. (New) A method according to claim ~~37~~<sup>36</sup>, wherein said composite is a dental prosthetic and in (ii) the hardening is intra-oral using said hand-held microwave applicator.

See Appendix

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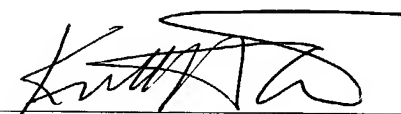
REMARKS

The Second Preliminary Amendment introduces non-elected claim 20 plus new dependent claims 21-35. New claims 36 et seq. are also added. Present claim 20 differs from parent application claim 20 in referring to an acrylic polymer and acrylic monomer, as seen from the original specification at pages 10 and 13.

Respectfully submitted,

FITCH, EVEN, TABIN & FLANNERY

By:



Kendrew H. Colton  
Registration No. 30,368

FITCH, EVEN, TABIN & FLANNERY  
1801 K Street, NW  
Suite 401L  
Washington, DC 20006-1201  
Telephone: (202) 419-7000  
Facsimile: (202) 419 -7007



Divisional of 09/391,  
STANGEL et al.

## APPENDIX

### In the claims:

Claims 1-19 canceled without prejudice

New Claims 20-39 added.